REMARKS

Claims 1-17 remain pending. Reconsideration of the application is respectfully requested in view of the following remarks, which address the final Office Action of September 4, 2009.

Request For Withdrawal Of Finality Of Office Action

Prosecution of this application was reopened after a Pre-Appeal Brief Review requested by Applicants. The first Office Action in this application (dated August 5, 2008) rejected the claims based on the Sorg, Bauer and Nakagawa references. Applicants traversed those rejections (with only clarifying amendments) in a response filed October 30, 2008, but these rejections were maintained in the Office Action of March 6, 2009, which was made final. The Pre-Appeal Review Panel concluded that the rejections should be withdrawn, as Applicants urged in their response to the August 5, 2008 Office Action and in their Pre-Appeal Brief Request For Review. The Examiner has now performed a new search and has rejected the claims based on newly found references, but has nevertheless made the Office Action final. Applicants point out that because the new search was not necessitated by Applicants' prior clarifying amendments, the current Office Action should be non-final. Accordingly, Applicants request that the finality of the present Office Action be withdrawn.

Obviousness Rejection Over Fukamura In View Of Fusaroli

Claims 1 and 10 stand rejected under 35 USC §103(a) as obvious over U.S. Patent No. 6,121,675 ("Fukamura") in view of U.S. Patent No. 4,971,930 ("Fusaroli"), both of which are newly found and newly cited in the present Office Action. This rejection is respectfully traversed.

Claim 1 recites, *inter alia*, that "the optical device and the semiconductor component are fixed relative to one another and pressed against one another to squeeze the connecting layer arranged therebetween", and "the connecting layer, when squeezed, is configured to generate an opposing force that strives to press the optical device and the radiation coupling area of the semiconductor component apart".

These features help prevent formation of air gaps between the connecting layer and the adjoining interfaces. This applies in particular to an entire operating temperature range of the module and to any action of additional deforming forces on the connecting layer such as, for instance, vibrations or centrifugal forces (see paragraph [0012] of Applicant's published specification).

Fukamura discloses, in connection with Figure 10(b) and column 1, line 46 to column 2, line 3, a CCD image sensor having a plastic substrate 63 onto which a semiconductor optical sensor chip 58 is bonded. Metal wiring patters 65 on the side of the sensor chip 58 are bonded to bonding pads of the sensor chip 58 via bonding wires. An insulating outer frame 64 is adhered to the plastic substrate 63 and the space surrounded by the insulating outer frame 64 is filled with transparent resin 69 such that the transparent resin 69 completely seals the sensor chip 58 and the bonding wires 56. A transparent plate 57 is fixed to the outer portion of frame 64 with transparent resin or adhesive 70.

The space surrounded by the insulating outer frame 64 is described in Fukamura as being **filled** with transparent resin 69, as opposed to the resin being **squeezed** between components. Moreover, nothing in Fukamura describes or suggests that the resin generates an opposing force striving to separate the components. Thus, as acknowledged in the Office Action, Fukamura does not describe or suggest that the optical device and the semiconductor component are fixed relative

to one another and pressed against one another to squeeze the connecting layer arranged therebetween, and the connecting layer, when squeezed, is configured to generate an opposing force that strives to press the optical device and the radiation coupling area of the semiconductor component apart, as recited in claim 1.

The Office Action turns to Fusaroli for these features missing from Fukamura. Fusaroli discloses in connection with Figures 9 to 11 and column 2, lines 26 to 43 a process wherein a container of opaque plastic material 41 is provided in the form of a hollow body carrying a semiconductor chip 44 in a central window 42. In a further process step, a mass of transparent resin 46 is poured over the semiconductor chip 44. In a further process step, a lens 48 is installed over the resin:

> In the window 42, utilizing the striking engagement with a shoulder 47, there is inserted a transparent lens 48 which compresses the mass of transparent resin 46, fixing the thickness thereof and distributing it uniformly in such a manner as to occupy all the interior space of the container 41.

(Fusaroli at col. 2, lines 34-39). This last step is illustrated by Figures 10 and 11. Figure 10 shows a mound of resin before the lens is inserted, and Figure 11 shows that as the lens is inserted into its fixed location, the resin is redistributed "to occupy all the interior space."

However, nothing in this description, or elsewhere in Fusaroli, describes or suggests that the resin is **squeezed** once the components are **fixed relative to one another**. Nor is there any description or suggestion that the resin **generates an opposing force** once the components are fixed relative to one another. Indeed, Fusaroli is utterly silent as to the forces between the resin and other components once they are fixed relative to one another. How would the lens squeeze the resin once the lens is in its fixed position resting on the shoulder? How would the resin

"generate an opposing force that strives to press the optical device and the radiation coupling area of the semiconductor component apart"?

Thus, Fusaroli does not remedy the deficiencies of Fukamura discussed above. Therefore, the combination of Fukamura and Fusaroli does not describe or suggest that the optical device and the semiconductor component are fixed relative to one another and pressed against one another to squeeze the connecting layer arranged therebetween, and the connecting layer, when squeezed, is configured to generate an opposing force that strives to press the optical device and the radiation coupling area of the semiconductor component apart, as recited in claim 1.

The Office Action states that one of ordinary skill in the art would have been motivated to combine Fusaroli with Fukamura "for the purpose of fixing the thickness." (Office Action at page 4). However, the structure disclosed in Fukamura has a frame 64 that determines the thickness of the resin 69 when the transparent plate 57 is installed. Thus, one of ordinary skill in the art would have no need whatsoever to look to Fusaroli, or anywhere else for that matter, to fix the thickness of the resin layer.

Accordingly, claim 1 is submitted to be patentable over the combination of Fukamura and Fusaroli.

Obviousness Rejections Over Bauer In View Of Spaeth And Other References

Claims 1-4, 7-13, 16 and 17 stand rejected under 35 USC §103(a) as obvious over U.S. Patent No. 6,130,448 ("Bauer") in view of U.S. Patent No. 5,981,945 ("Spaeth"). Claim 6 stands rejected as obvious over Bauer in view of Spaeth and U.S. Patent Application Publication No. 2002/0057057 ("Sorg"). Claims 5, 14, and 15 stand rejected as obvious over Bauer in view of Spaeth and U.S. Patent No. 5,556,809 ("Nakagawa"). These rejections are respectfully traversed.

Bauer was cited in the first and second Office Actions in this application and, together with Sorg, formed the basis of the rejections withdrawn by the Panel decision. As such, these references have already been extensively addressed in detail in Applicants' previous responses. The Examiner now combines Bauer with the newly found Spaeth reference. However, as discussed below, the newly found Spaeth reference does not remedy the shortcomings of Bauer and Sorg previously laid out by Applicants and acknowledged by the Panel.

Bauer discloses in Figure 2, and in the corresponding description in column 5, a package having an optical sensor 22 which is attached to the top side of base substrate 28 and which is surrounded by a seal material 46. A window 48 is bonded to the base substrate 28 in a spaced-apart relationship, the spacing distance determined by the seal material 46. The cavity 52, which is formed and enclosed by the base substrate 28, the seal material 46 and the window 48, may be filled with an optically transparent curable resin.

As acknowledged in the Office Action Bauer does not describe or suggest that the optical device and the semiconductor component are fixed relative to one another and pressed against one another to squeeze the connecting layer arranged therebetween, and the connecting layer, when squeezed, is configured to generate an opposing force that strives to press the optical device and the radiation coupling area of the semiconductor component apart, as recited in claim 1.

The Office Action turns to Spaeth for these features missing from Bauer. Spaeth discloses an optoelectronic transducer 11 which has a base plate 1 and spacers 7 thereon. A lens system 8 is located on and joined to the spacers 7 by adhesive bonding and/or soldering. A solder or adhesive layer 9 is inserted between the spacers 7 and the lens system 8 (see Figure 1 and column 3 lines 1 to 20 and lines 43 to 56).

The Examiner cites adhesive layer 9 as being the connecting layer. This is incorrect.

Claim 1 recites that the connecting layer is made of a radiation-transmissive, deformable material arranged in a gap between the radiation coupling area of the semiconductor component and the optical device. Adhesive layer 9 in Spaeth is positioned between the spacers 7 and the lens 8, rather than between the semiconductor component 6 and the lens 8. Adhesive layer 9 is not described as being radiation-transmissive, nor is adhesive layer 9 described as being deformable. Thus, adhesive layer 9 is not the claimed connecting layer.

Nevertheless, assuming *arguendo*, that adhesive layer 9 could be the claimed connecting layer, how would the optical device and the semiconductor device squeeze adhesive layer 9 when it is not disposed between those two components? How would adhesive layer 9, at the same time, generate an opposing force on these components?

It is clear that Spaeth does not remedy the deficiencies of Bauer discussed above. The combination of Bauer and Spaeth therefore does not describe or suggest that the optical device and the semiconductor component are fixed relative to one another and pressed against one another to squeeze the connecting layer arranged therebetween, and the connecting layer, when squeezed, is configured to generate an opposing force that strives to press the optical device and the radiation coupling area of the semiconductor component apart, as recited in claim 1

The Office Action states that one of ordinary skill in the art would have been motivated "to fix as taught by Spaeth, Bauer's semiconductor component and Bauer's optical device relative to one another to squeeze Bauer's connecting layer, for the purpose of making the module compact." (Office Action at page 5). However, Bauer's optical sensor 22 and window 48 are separated by the thickness of the surrounding seal material 46. Adding an adhesive layer between the seal material 46 and the window 48 (similar to the way in which adhesive layer 9 is

positioned between the spacers 7 and lens 8 in Figures 1 and 2 of Spaeth), in addition to being completely unnecessary, would actually make the device ***larger*** – not more compact.

Accordingly, claim 1 is submitted to be patentable over the combination of Bauer and Spaeth. A review of Sorg and Nakagawa (cited against the dependent claims) has failed to reveal anything that would remedy the deficiencies of the combination of Baer and Spaeth with respect to the features of claim 1.

Independent Claim 10 And The Dependent Claims

Independent Claim 10 recites features similar to those of Claim 1 and therefore is also believed to be patentable over the cited references for the reasons discussed above.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

Conclusion

Based on the foregoing remarks, this application is in condition for allowance. Early passage of this case to issue is respectfully requested.

It is believed that no fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

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